Transition Region and Coronal Explorer (TRACE) Mission Operations Team (MOT) Operations Agreements

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Section 1 - Purpose

This agreement outlines responsibilities for operations, maintenance, training, and points of contact for each operational system located in the Transition Region and Coronal Explorer (TRACE) Mission Operations Center (MOC). These agreements are made between the TRACE Mission Operations Team (MOT) and the supporting organizations of the Applied Engineering and Technology Directorate (AETD).

Section 2 - Software Maintenance Responsibilities

This section describes the software maintenance responsibilities for the various AETD-provided TRACE software systems.

2.1 Flight Dynamics Analysis Branch Responsibilities

Flight Dynamics Analysis Branch (Code 574) responsibilities include:

- Provide operational support of the Flight Dynamics Support System (FDSS) software through completion of software verification in a normal operational mode.
- Provide a transition plan for turnover of FDSS support following software verification to the TRACE MOT.
- Provide training to MOT on the operational use of the FDSS software.
- Provide contingency support in the event of FDSS software problems. During the launch and early orbit (L&EO) operations, response shall be within two hours of notification from 9:00 AM to 5:00 PM, and within four hours from 5:00 PM to 9:00 AM. Following transition to normal operations, the 5:00 PM to 9:00 AM support is eliminated.
- Provide documentation associated with FDSS software modifications. This may include updates to requirements documents, user's guide, and Interface Control Documents (ICDs).
- Provide a delivery letter, version description, and installation with any approved FDSS change.
- Initiate a Configuration Change Request (CCR) for each recommended change to the FDSS software.

2.2 Mission Applications Branch Responsibilities

Mission Application Branch (Code 583) responsibilities include:

- Provide training to MOT on the operational use of the Command Management System (CMS) software.

- Provide contingency support in the event of CMS software problems. During the L&EO operations, response shall be within two hours of notification from 9:00 AM to 5:00 PM, and within four hours from 5:00 PM to 9:00 AM. Following transition to normal operations, the 5:00 PM to 9:00 AM support is eliminated.
- Provide documentation associated with CMS software modifications. This may include updates to requirements documents, user's guide, and ICDs.
- Provide a delivery letter, version description, and installation with any approved CMS change.
- Initiate a CCR for each recommended change to the CMS software.

2.3 Realtime Software Engineering Branch Responsibilities

Realtime Software Engineering Branch (Code 584) responsibilities include:

- Provide training to MOT on the operational use of the Integrated Test and Operations System (ITOS) and Data Trending and Analysis System (DTAS) software.
- Provide contingency support in the event of ITOS or DTAS software problems. During the L&EO operations, response shall be within two hours of notification from 9:00 AM to 5:00 PM, and within four hours from 5:00 PM to 9:00 AM. Following transition to normal operations, the 5:00 PM to 9:00 AM support is eliminated.
- Provide documentation associated with ITOS or DTAS software modifications. This may include updates to requirements documents, user's guide, and ICDs.
- Provide a delivery letter, version description, and installation with any approved ITOS or DTAS change.
- Initiate a CCR for each recommended change to the ITOS or DTAS software.

2.4 Advanced Architectures and Automation Branch Responsibilities

Advanced Architectures and Automation Branch (Code 588) responsibilities include:

- Provide training to MOT on the operational use of the Emergency Response System (ERS) software.

- Provide contingency support in the event of ERS software problems. During the L&EO operations, response shall be within two hours of notification from 9:00 AM to 5:00 PM, and within four hours from 5:00 PM to 9:00 AM. Following transition to normal operations, the 5:00 PM to 9:00 AM support is eliminated.
- Provide documentation associated with ERS software modifications. This may include updates to requirements documents, user's guide, and ICDs.
- Provide a delivery letter, version description, and installation with any ERS change.
- Initiate a CCR for each recommended change to the ERS software.

2.5 Flight Software Maintenance Element (FSME) Responsibilities

Flight Software Maintenance Element responsibilities include:

- Initiate and chair the TRACE Flight Software Configuration Control Board (CCB). The CCB will begin formal operations following the TRACE launch and in-orbit checkout phase. The CCB will meet on an as-needed basis to discuss, authorize, and establish actions related to requested flight software configuration changes, and to establish schedules for approved flight software and table changes.
- Support on-orbit anomaly investigations as related to flight software and/or as requested by the MOT. Perform flight software analysis as appropriate using on-orbit support tools and the FSME Software Development and Verification Facility (SDVF).
- Design, implement, and validate approved memory/table updates to a flight image. Design and code walkthroughs shall be organized as necessary with other relevant organizations. The SDVF shall be used to validate the planned memory/table update procedures, ensure that the desired change is achieved, and verify that no adverse effects result from the change. On-orbit verification criteria to be followed when uplinking the change shall be established based on SDVF test results. Functional verification may include certain events to monitor and telemetry values to verify.
- Provide documentation associated with flight software memory and table modifications. This can include updates to requirements documents, user's guide, ICDs, and Telemetry and Command (T&C) documentation.

- Provide a delivery letter, version description, uplink procedures, and verification criteria with any approved flight software memory or table change. The uplink procedure shall include any special flight software configuration set-up required at the time of the uplink and any special flight software configuration set-up required to return the flight software to a normal operations configuration after the uplink.
- Maintain master images of flight tables on the SDVF as appropriate.
- Maintain on-board support tools for the TRACE FSME personal computer (PC).
- Maintain the Dynamic Simulator, the Guide Telescope Simulator, the Remote Terminal simulator, and the Spacecraft Command and Telemetry System PC in the SVDF.
- Initiate a CCB Flight Software Configuration Change Request (FSCCR) for each recommended memory or table update to the TRACE flight software.

Appendix A contains a list of table responsibilities for the FSME and MOT. Appendix B contains a list of products which are transferred between the MOC and the FSME. Appendix C contains a description of the TRACE memory and table load file formats.

Section 3 - Hardware Maintenance Responsibilities

This section describes the hardware maintenance responsibilities for the various AETD provided TRACE hardware systems.

3.1 Allied Signal Computer Systems Group Responsibilities

The Allied Signal Technical Services Corporation (ATSC) Computer Systems Group (CSG) responsibilities include:

- Provide all necessary hardware maintenance for the workstations listed in Table 3-1.
- Provide contingency support in the event of workstation hardware problems. During the L&EO operations, response shall be within 30 minutes of notification, 24 hours per day. Following transition to normal operations, response shall be within 30 minutes of notification from 8:00 AM to 12:00 PM, and within four hours from 12:00 PM to 8:00 AM.

Host Name	CPU	Location
traceops1	Sun Ultra 170	Bldg. 3 Rm. S57
traceops2	Sun Ultra 170E	Bldg. 3 Rm. S57
traceops3	Sun Ultra 170	Bldg. 3 Rm. S57
traceops4	Sun Ultra 170E	Bldg. 3 Rm. S57
tracecms	HP J210	Bldg. 3 Rm. S57
dptrace2	SGI Challenge DM2	Bldg. 3 Rm. S5A
dptrace3	SGI Challenge DM2	Bldg. 3 Rm. S5A

Table 3-1. ATSC CSG Workstation Maintenance

3.2 Advanced Architectures and Automation Branch Responsibilities

Advanced Architectures and Automation Branch (Code 588) responsibilities include:

- Provide all necessary hardware maintenance for the workstations listed in Table 3-2.
- Provide contingency support in the event of workstation hardware problems. Response shall be within two hours of notification from 9:00 AM to 5:00 PM, and within four hours from 5:00 PM to 9:00 AM.

Host Name	CPU	Location
smexvmoc1	Compaq Deskpro 6000	Bldg. 3 Rm. S57
smexvmoc2	Compaq Deskpro 6000	Bldg. 3 Rm. S57

Table 3-2. Advanced Architectures and Automation Branch Workstation Maintenance

Section 4 - Mission Operations Team Responsibilities

This section describes the MOT responsibilities with respect to the operational hardware and software used in support of the TRACE mission.

TRACE MOT responsibilities include:

- Coordinate with the General Services Agreement (GSA) 4 owner to provide all necessary hardware platforms required for operational support of the TRACE mission.
- Provide all system administration for operational hardware and software.
- Maintain a library of all delivered documentation and software releases.
- Notify the appropriate external hardware or software point of contact whenever anomalies occur and external support is required.
- Provide all necessary hardware maintenance for workstations not specified in Section 3.

Section 5 - Administration

This section describes the change procedures for making and installing software modifications, and lists the points of contact for each applicable element.

5.1 Change Procedures

A Configuration Change Request form will be used to recommend and track all non-flight software changes. A sample CCR form is included in Appendix D.

A Flight Software Configuration Change Request form will be used to recommend and track all flight software changes. A sample CCR form is included in Appendix E. In addition to tracking flight software changes, the FSCCR form can be used for requests to perform tests and analysis of the flight software. This provides a mechanism for tracking work by the Flight Software Maintenance Team.

A FSCCR database will be established for all post-launch FSCCRs and a report of the current status of all FSCCRs should be available at each meeting of the Flight Software CCB. Responsibility for maintenance of the FSCCR database resides with the FSME.

5.2 Points of Contact

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TRACE ITOS (Display, Telemetry, Network)
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TRACE Test Team (DPS)

Rich Reider

Appendix A

This appendix contains the listing of spacecraft processor table responsibility.

Table	Table Name	Dump Only	Responsibility
00	RTS 00		FSME
01	RTS 01		FSME
02	RTS 02		FSME
03	RTS 03		FSME
04	RTS 04		MOT
05	RTS 05		MOT
06	RTS 06		FSME
07	RTS 07		MOT
08	RTS 08		FSME
09	RTS 09		FSME
10	RTS 10		FSME
11	RTS 11		FSME
12	RTS 12		FSME
13	RTS 13		MOT
14	RTS 14		FSME
15	RTS 15		FSME
16	RTS 16		FSME
17	RTS 17		FSME
18	RTS 18		FSME
19	RTS 19		FSME
20	RTS 20		MOT
21	RTS 21		MOT
22	RTS 22		MOT
23	RTS 23		MOT
24	RTS 24		FSME
25	RTS 25		MOT
26	RTS 26		MOT
27	RTS 27		FSME
28	RTS 28		FSME
29	RTS 29		FSME
30	RTS 30		FSME
31	RTS 31		MOT
32	RTS 32		MOT
33	RTS 33		MOT
34	RTS 34		MOT
35	RTS 35		MOT
36	RTS 36		MOT
37	RTS 37		MOT
38	RTS 38		MOT
39	RTS 39		MOT
40	RTS 40		MOT

Table	Table Name	Dump Only	Responsibility
41	RTS 41		MOT
42	RTS 42		MOT
43	RTS 43		MOT
44	RTS 44		MOT
45	RTS 45		MOT
46	RTS 46		MOT
47	RTS 47		MOT
48	RTS 48		MOT
49	RTS 49		MOT
50	RTS 50		MOT
51	RTS 51		MOT
52	RTS 52		MOT
53	RTS 53		MOT
54	RTS 54		MOT
55	RTS 55		MOT
56	RTS 56		MOT
57	RTS 57		MOT
58	RTS 58		MOT
59	RTS 59		MOT
60	RTS 60		MOT
61	RTS 61		MOT
62	RTS 62		MOT
63	RTS 63		MOT
64	ATS A		MOT
65	ATS B		MOT
66	ATS A Status	Yes	FSME
67	ATS B Status	Yes	FSME
68	RTS Control	Yes	FSME
69	TO 10k Filter		FSME
70	TO 16k Filter		FSME
71	TO 32k Filter		FSME
72	TO 64k Filter		FSME
73	DS Filter		FSME
74	DS Destination		FSME
75	DS Sector Map		FSME
76	Unused		
77	Unused		
78	SM TOT Status	Yes	FSME
79	SM Memory Dwell		FSME
80	Unused		
81	HK Events		FSME
82	Unused		
83	Unused		
84	Unused		
85	Unused		
86	SH Scheduler		FSME
87	OS Mode Transition	Yes	FSME

Table	Table Name	Dump Only	Responsibility
88	OS Task Definition		FSME
89	XB Internal HK Data	Yes	FSME
90	SB Stream Init		FSME
91	SB Pipe Init		FSME
92	SB Memory Partition		FSME
93	SB Streams	Yes	FSME
94	SB Pipes	Yes	FSME
95	LC Watch Definition		FSME
96	LC Watch Results	Yes	FSME
97	LC Action Definition		FSME
98	LC Action Results	Yes	FSME
99	SM Table of Table		FSME
100	Testing table		FSME
101	Code Segment 1		FSME
102	Code Segment 2		FSME
103	Code Segment 3		FSME
104	Code Segment 4		FSME
105	Code Segment 5		FSME
106	Code Segment 6		FSME
107	Code Segment 7		FSME
108	Code Segment 8		FSME
109	Code Segment 9		FSME
110	Unused		
111	Code Segment 11		FSME
112	Code Segment 12		FSME
113	Unused		
114	Unused		
115	Unused		
116	Unused		
117	Unused		
118	Unused		
119	Unused		
120	Unused		
121	EEPROM Page FC00		FSME
122	EEPROM Page FC01		FSME
123	EEPROM Page FC02		FSME
124	EEPROM Page FC03		FSME
125	EEPROM Page FC04		FSME
126	EEPROM Page FC05		FSME
127	EEPROM Page FC06		FSME
128	EEPROM Page FC07		FSME
129	EEPROM Page initial tables		FSME
130	EEPROM Page FFFF		FSME

Table A-1. Spacecraft Processor Table Responsibility

Appendix B

This appendix contains the list of products which are transferred between the MOC and the FSME.

File Type	Naming Convention	From/ Host Platform	To/ Target Platform/ Directory	Delivery Schedule	Comments
RTS Load	tfswxxxnn_mm.rts	FSME smexs2	MOC traceops2 /home/fsmf/TRACE/LOADS	As necessary	xxx: ram or rom depending on the destination of the load nn: rts # (0-63) mm: 2-digit sequence number
ATS Load	tfswatsnn_mm.atf	FSME smexs2	MOC traceops2 /home/fsmf/TRACE/LOADS	As necessary	nn: ats # (64 or 65), ram only mm: 2-digit sequence number
Table Load	tfswxxxnnn_mm.tbl	FSME smexs2	MOC traceops2 /home/fsmf/TRACE/LOADS	As necessary	xxx: ram or rom depending on the destination of the load nnn: table # mm: 2-digit sequence number
Memory Load	tfswxxx_mm.mem	FSME smexs2	MOC traceops2 /home/fsmf/TRACE/LOADS	As necessary	xxx: ram or rom depending on the destination of the load mm: 2-digit sequence number
STOL Procedure	tfsw*.proc	FSME smexs2	MOC traceops2 /home/fsmf/TRACE/PROCS	As necessary	*: This portion of the name depends on the particular procedure being delivered
Table Dump	ttblxxxyyddd_mm.DMP	MOC traceops2	FSME traceops2 /home/fsmf/TRACE/DUMPS	As necessary	xxx: ram or rom depending on the destination of the load yy: 2 digit year ddd: day of year mm: 2-digit sequence number
Memory Dump	tmemyyddd_mm.DMP	MOC traceops2	FSME traceops2	As necessary	yy: 2 digit year ddd: day of year mm: 2-digit sequence number

			/home/fsmf/TRACE/DUMPS		
Event Log	tevntyyddd_mm.log	MOC traceops2	FSME traceops2 /home/fsmf/TRACE/LOGS	As necessary	yy: 2 digit year ddd: day of year mm: 2-digit sequence number
Report	trptyyddd_mm.rpt	MOC traceops2	FSME traceops2 /home/fsmf/TRACE/REPORTS	As necessary	yy: 2 digit year ddd: day of year mm: 2-digit sequence number
Sequential Print	tseqyyddd_mm.seq	MOC traceops2	FSME traceops2 /home/fsmf/TRACE/SEQPRTS	As necessary	yy: 2 digit year ddd: day of year mm: 2-digit sequence number
Snap	tsnyyddd_mm.snap	MOC traceops2	FSME traceops2 /home/fsmf/TRACE/SNAPS	As necessary	yy: 2 digit year ddd: day of year mm: 2-digit sequence number
ITOS telemetry and command database	tracexxxdbv.vv		FSME traceops2 (SUN) /home/trace/db/trace/database traceleo1 (PC) /home/trace/db/trace/database	As needed	xxx: platform (Sun or PC) v.vv: database version number

Table B-1. MOC/FSME Transferred Products

Appendix C

This appendix contains a description of the TRACE memory and table load file formats. The following is an excerpt from the SMEX/TRACE Telemetry and Command Handbook, Volume I.

Memory Loads

All memory load commands shall use the same format as shown in Table 1-3. The first entry in the table is placed at octet zero of the command packet application data and the remaining items follow sequentially.

Data Item	Data Type	Description
Starting Address	ULI	starting address for loading this packet
Memory Type	UB	1 = EEPROM; 2 = RAM
Packet Data Size	UB	number of valid load bytes in this packet (must be ≤ 200)
Data	UB	octet array of memory data (must be ≤ 200 bytes)

Table C-1. Memory Load Format

The octet array of data shall be uplinked in octet consecutive order, which includes any required octet/word swapping of the data types.

Table Loads

All table load commands shall use the same format as shown in Table 1-4. The first entry in the data portion of every table is a four byte load generation time and the remaining items follow sequentially starting at octet four. The load generation time is in the TIME40 format and is present only in the first packet of the load.

Data Item	Data Type	Description
Starting Offset	ULI	starting offset to load this packet
Spare	UB	spare
Packet Data Size	UB	number of valid load bytes in this packet (must be <= 200)
Data	UB	octet array of table data (must be <= 200 bytes)

Table C-2. Table Load Format

The octet array of data shall be uplinked in octet consecutive order, which includes any required octet/word swapping of the data types.

SCP Table Formats

The spacecraft will use a Stored Command Processor (SCP) approach for executing commands at a time later than uplink. The SCP shall keep the stored commands in buffers. There are two types of stored commands: absolute time commands and relative time commands.

ATS Buffers

The spacecraft shall provide an Absolute Time Sequence (ATS) command capability. Two ATS command buffers, buffer 'A' and buffer 'B', shall be provided. Only one of the two ATS buffers will be active at a time. Each ATS buffer shall have a command capacity not to exceed 35,000 bytes, plus the four byte table timestamp. The maximum number of commands is 400. The commands need not be in time sequence order. The variable length structures shown are packed into the buffers so that the command number of one structure follows immediately after the checksum of the previous structure.

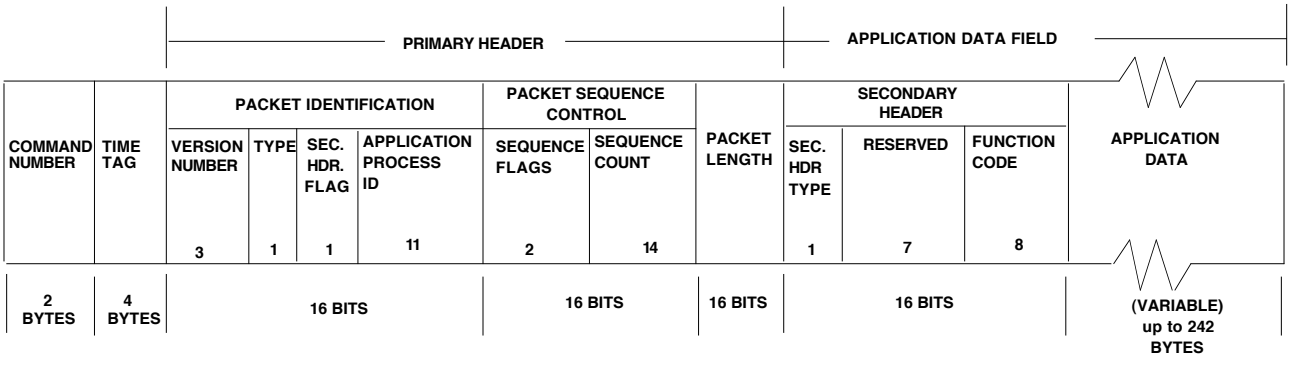

Figure C-1. ATS Buffers

Command Number

Command number is an unsigned integer.

Time Tag

This Time Tag is in TIME40 format.

Primary Header

Packet primary header is defined in Section 3.5.1.1 of the SMEX/TRACE Telemetry and Command Handbook, Volume I.

Secondary Header

Secondary header is defined in Section 3.5.1.2 of the SMEX/TRACE Telemetry and Command Handbook, Volume I.

Application Data

Command application data typically includes data indicating a selected option (e.g., off, low, high), a set-to value, or other data necessary for command execution.
The last 16 bits of the Application Data contains the checksum of the packet, which is an unsigned integer. The checksum algorithm is described in TRACE-REF-001, TRACE C&DH Flight Software User's Guide.

RTS Buffers

The spacecraft shall accommodate 64 Relative Time Sequences (RTSs), with each RTS not to exceed 300 bytes, plus the four byte table timestamp. The RTS commands must be time ordered. All RTSs can be activated concurrently. The variable length structures shown are packed into the buffers so that the command number of one structure follows immediately after the checksum of the previous structure.

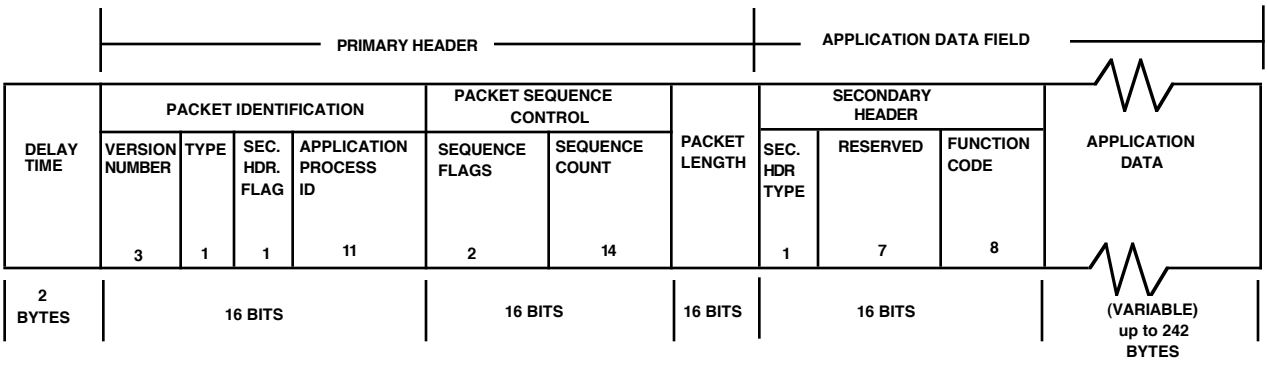

Figure C-2. RTS Buffers

Delay Time

Number of seconds the processor will delay before processing command relative to previous command.

Primary Header

Packet primary header is defined in Section 3.5.1.1 of the SMEX/TRACE Telemetry and Command Handbook, Volume I.

Secondary Header

Secondary header is defined in Section 3.5.1.2 of the SMEX/TRACE Telemetry and Command Handbook, Volume I.

Application Data

Command application data typically includes data indicating a selected option (e.g., off, low, high), a set-to value, or other data necessary for command execution. The last 16 bits of the Application Data contains the checksum of the packet, which is an unsigned integer. The checksum algorithm is described in TRACE-REF-001, TRACE C&DH Flight Software.

Image File Specification

The load and dump image files are ASCII files with ASCII header records. There are five ASCII header records (the abstract record, the identification record, the table select record, the load record, and the table commit record) and a variable number of ASCII data records.

The ASCII header records are broken up into fields. Each field, except the last, is terminated by a comma; the last field in a record is terminated by <CR><LF>(ASCII 12 and ASCII 10) characters.

Each data record starts with the character "X" indicating hexadecimal characters and followed by only the data bytes. Data bytes can have any number of space characters (ASCII 20_{16}) in them for readability and these spaces are ignored. Data records are in ascending order by start location. Data bytes are byte swapped as specified by the data type field in the identification record. A semicolon (";") character is used for the beginning of a comment. Anything from the beginning of the comment character to the end of the record is ignored.

Since the 386 processor swaps the bytes within a word, the order of bytes for each of the data types (except for time codes) at each stage of processing is illustrated here:

Bytes (UI386) *(This loads 8 bytes)*

Load File Format	:	n+0	n+1	n+2	n+3	n+4	n+5	n+6	n+7
Uplink Format	:	n+1	n+0	n+3	n+2	n+5	n+4	n+7	n+6 Swap Bytes
Stored on 80386	:	n+0	n+1	n+2	n+3	n+4	n+5	n+6	n+7 Swap Bytes

Words (UI, UB, SI and SB) *(This loads 4 words)*

Load File Format	:	n+0	n+1	n+2	n+3	n+4	n+5	n+6	n+7
Uplink Format	:	n+0	n+1	n+2	n+3	n+4	n+5	n+6	n+7
Stored on 80386	:	n+1	n+0	n+3	n+2	n+5	n+4	n+7	n+6 Swap Bytes

Long Words and Floats (ULI, SLI and SFP) *(This loads 2 long words)*

Load File Format	:	n+0	n+1	n+2	n+3	n+4	n+5	n+6	n+7
Uplink Format	:	n+2	n+3	n+0	n+1	n+6	n+7	n+4	n+5 Swap Words
Stored on 80386	:	n+3	n+2	n+1	n+0	n+7	n+6	n+5	n+4 Swap Bytes

Double Floats (DFP) *(This loads 1 double float)*

Load File Format	:	n+0	n+1	n+2	n+3	n+4	n+5	n+6	n+7

Uplink Format : n+6 n+7 n+4 n+5 n+2 n+3 n+0 n+1 Swap Long Words and Swap Words

Stored on 80386 : n+7 n+6 n+5 n+4 n+3 n+2 n+1 n+0 Swap Bytes

The record order and description of the load and dump image files are shown in Table 1-5.

Record Number	Record Type	Description
1	Abstract record	Describes the functional purpose of the file and other information, such as the operational impacts of loading this file. (This record may be blank in the dump files.)
2	Identification record	Contains basic information that uniquely identifies this file; the information includes the mission, creation date, version number, source, maximum packet size and data type separated by commas. (parts of this record may be blank in the dump files.)
3	Table Select record	Contains STOL Table Select command.
4	Load record	Contains STOL Load command.
5	Table Commit record	Contains Table Commit command.
6	Data record	Starts a set of ASCII data records which, for comparison images, provides values for all static data. In addition, data may be provided for all or part of the dynamic portion of the image.
*	Data record	*
n	Data record	*

Table C-2. Image File Format

The detailed record and field descriptions of the ASCII header records (abstract, identification, table select, load and table commit records) and ASCII data records are shown in Tables 1-6 through 1-11. Each field, except for the last, in each record is terminated by a comma; the last field is terminated by a line feed character (ASCII 10).

Field Width	Field Description
Up to 60 characters	Abstract - Specifies the functional purpose of the image. (This record may be blank in the dump files.)

Table C-3. Abstract Record Format

Field Width	Field Description
Up to 15 characters	Mission name
Up to 6 characters	Image ID
15 characters	Date created - The date the file was created formatted as *yy-ddd-hh:mm:ss* GMT.
3 characters decimal	Version number - Identifies the version of the file. (This field may be blank in the dump files.)
Up to 10 characters	Source - Identifies the originator of the source file. Options include EOF, IGSE, FSME, POCC etc.
4 characters	Maximum packet size in hexadecimal format
Up to 6 characters	Data type - This field indicates the byte ordering of the data field.
Up to 7 characters	File type. Possible values are LOAD for a full load or PARTIAL for a patch load.
4 characters	File checksum in zero filled hexadecimal format. Calculated by adding all ASCII bytes in the file from after the carriage return (ASCII 13) and the line feed (ASCII 10) that terminates the Identification Record. Carriage returns, line feeds, and EOF markers are not included in the calculations.

Table C-4. Identification Record Format

Field Width	Field Description
Up to n characters	This field contains either /NOSELECT or /CTBLSEL followed by its submnemonics. Each submnemonic is separated by a comma. Variable submnemonics are followed by an "=" sign and a corresponding value. The submnemonics can be in any order following the /CTBLSEL.

Table C-5. Table Select Record Format

Field Width	Field Description
Up to n characters	This field contains either /CTBLLOAD or /CMEMLOAD followed by some of its submnemonics. Each submnemonic is separated by a comma. Variable submnemonics are followed by an "=" sign and a corresponding value. The submnemonics can be in any order following the /CTBLLOAD or /CMEMLOAD.

Table C-6. Load Record Format

Field Width	Field Description
Up to n characters	This field contains either /NOCOMMIT or /CTBLCOMMIT followed by some of its submnemonics. Each submnemonic is separated by a comma. Variable submnemonics are followed by an "=" sign and a corresponding value. The submnemonics can be in any order following the /CTBLCOMMIT.

Table C-7. Table Commit Record Format

Field Width	Field Description
Up to n characters (hexadecimal)	ASCII Data bytes - For load images, provides the data bytes to be loaded into the spacecraft tables or memory. For dump images, contains the data bytes which were dumped from the spacecraft tables or memory. Each data record starts with the letter "X". A semi-colon character (";")indicates the beginning of a comment which should be ignored to the end of the line. All the data is in hexadecimal format. Data can be separated by spaces (ASCII 20_{16}) and these spaces should be ignored.

Table C-8. ASCII Data Record Format

Following is a sample TRACE load image file:

Record 1 - Abstract record (ASCII):

ATS 24.2 for SCP Errors Test<CR><LF>

Record 2 - Identification record (ASCII):

TRACE,RAM1,93-014-12:34:00,001,FSME,00C8,UI <CR><LF>

Record 3 - Table Select record (ASCII):

/SMTBLSELECT TABLID=51,SRCZERO,DESTRAM<CR><LF>

Record 4 - Table Select record (ASCII):

/SMTBLLOAD OFFSET=0<CR><LF>

Record 5 - Table Select record (ASCII):

/SMTBLCOMMIT CKENABLE,CHECKSUM=X'2AF7'<CR><LF>

Record 6 through 14- Data records (ASCII):

;<CR><LF>

;Cmd# DAY Time ApID Seq Ln FC Ck End RTS<CR><LF>

X0002 1ED4 000249 00 180B C000 0001 000B 702A;<CR><LF>

;<CR><LF>

;Cmd# DAY Time ApID Seq Ln FC Data Ck Chain to RTS1<CR><LF>

X0003 1ED4 00024E 00 180B C000 0003 000C 0100 772F;<CR><LF>

;<CR><LF>

;Cmd# DAY Time ApID Seq Ln FC Ck End ATS<CR><LF>

X0004 1ED4 000253 00 180B C000 0001 000E 6A29;<CR><LF>

Appendix D

This appendix contains a sample Configuration Change Request. All software changes must be accompanied by a completed CCR.

TRACE MOC/EOF Facilities
Post-Freeze Configuration Change Request

Report Number: _____
DR/CCR Number: _____
DR/CCR Priority: _____
Date: _____

The completion of this report is mandatory for all changes implemented in the TRACE MOC and EOF between the freeze date of January 7, 1998 and the TRACE launch.

The changes described in the attached justification has been reviewed, concurred and approved by all affected parties as identified. All required testing has been accomplished and all groups have agreed to update the MOC/EOF configuration with the new HW/SW items

Please review, sign, and pass on.

Originator: _____ **DATE:**_____

MRTT Concurrence:_____ **DATE:**_____

GDS SE Concurrence:_____ **DATE:**_____

MOT Concurrence:_____ **DATE:**_____

GSPM/IM Approval:_____ **DATE:**_____

TRACE MOC/EOF Facilities
Post-Freeze Justification Summary

Report Number: _____

SW/HW Element Affected: _____

Change Justification: _____
_____
_____
_____
_____
_____
_____
_____
_____
_____

Operations Impact, if not accepted: _____
_____
_____
_____

Re-certification Testing Required: _____
_____
_____
_____
_____

Appendix E

This appendix contains a sample Flight Software Configuration Change Request. All flight software changes must be accompanied by a completed FSCCR.

Flight Software Configuration Change Request

CCR #	Project Name:	CCR Date:	CCR Title:

Request Type

☐ **Configuration Change Req.** ☐ **Software Problem Rpt.**

Problem Description:

Request Description:

Software Affected:

Originator:	Recommended Priority:	Assigned Priority:

Analysis/Action Recommended:

System/Operations Impact & Items Affected:

Actual Solution/Implemented Action:

Current Status:

Close-out Section

Signature: **Date:**

CCB Chair:	
Originator:	
Implementer:	
FOT Manager:	
POD:	
Other:	
Other:	

Acronyms

AETD	Applied Engineering and Technology Directorate
ATS	absolute time sequence
ATSC	Allied Signal Technical Services Corporation
CCB	Configuration Control Board
CCR	Configuration Change Request
C&DH	Command and Data Handling
CMS	Command Management System
CSG	Computer Systems Group
DTAS	Data Trending and Analysis System
ERS	Emergency Response System
FDSS	Flight Dynamics Support System
FSCCR	Flight Software Configuration Change Request
FSME	Flight Software Maintenance Element
GSA	General Services Agreement
ICD	Interface Control Document
ITOS	Integrated Test and Operations System
L&EO	launch and early orbit
MOC	Mission Operations Center
MOR	Mission Operations Room
MOT	Mission Operations Team
PC	personal computer
RTS	relative time sequence
SCP	stored command processor
SDVF	Software Development and Verification Facility

SMEX	Small Explorer
T&C	Telemetry and Command
TRACE	Transition Region and Coronal Explorer